REMARKS

Claims 1-15 remain under consideration in this application with no claim previously indicated as allowable.

The Examiner maintained the rejections of Claim 1-15 under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 5,010,346 to Hamilton et al. ("*Hamilton*") in view of various combinations of U.S. Patent No. 6,421,478 to Paiam ("*Paiam*"), JP11-055320 to Okugawa et al. ("*Okugawa*"), U.S. Patent No. 5,414,548 to Tachikawa et al. ("*Tachikawa*"), U.S. Patent No. 3,838,278 to Duguay et al. ("*Duguay*"), U.S. Patent No. 5,937,117 to Ishida et al. ("*Ishida*"), U.S. Patent No. 5,546,483 to Inoue et al.("*Inoue*"), JP09-258045 to Kito et al. ("*Kito*") and U.S. Patent No. 5,748,811 to Amersfoort et al. ("*Amersfoort*").

In paragraph No. 15 on page 12 of the Office Action, the Examiner alleged that the features upon which the Applicant relies (i.e., a purely optical device that operates entirely in an optical region) were not recited in the rejected claims. In the foregoing amendment, the Applicant explicitly recited that the optical signal processing device as defined by independent Claims 1 and 11 is a purely optical device that operates entirely in an optical region.

With the foregoing amendment, the Applicant traverses the rejections of Claims 1-15 for the reasons discussed below, which were also discussed in the Applicant's First Response.

First, it should be clearly understood that the present invention as defined in Claim 1 provides an optical signal processing device capable of carrying out the optical signal processing for reading information on a destination or the like from optical signals at high speed, by realizing the digital-to-analog conversion of the input optical signals in an optical region, without converting the input optical signals into electric signals for the purpose of signal processing (see page 2, lines 24-28 and page 15, lines 16-28 of the present specification).

The present invention as defined in Claim 11 also provides an optical signal processing device capable of realizing the processing of the optical signals that are multiplexed on a time axis such as interchanges of time-slots, without converting the input optical signals into electric signals for the purpose of signal processing (see page 16, lines 2-15 of the present specification).

In particular, it should be noted that the optical signal processing device of the present invention is a purely optical device that operates entirely in an optical region, so that it does not require the conversion of optical signals into electric signals for the purpose of signal processing.

Regarding Claim 1, the Examiner correctly admits that *Hamilton* fails to disclose the claimed combiner, output waveguide, optical gate and amplitude adjustment. However, the rejection erroneously contends that these missing elements can be supplemented from various disclosures made by *Paiam*, *Okugawa*, and *Tachikawa*.

The Applicant points out that *Hamilton* also fails to disclose the claimed optical delay waveguide array with mutually different delay amounts, because *Hamilton*'s Fig. 1, element 32 is in fact a waveguide modulator array for modulating light pulses as a function of the intensity of the analog signal (see col. 5, lines 34-62).

More importantly, *Hamilton*'s disclosure is directed to an electro-optical analog-to-digital converter which produces digital electric signals from the analog signal (see Abstract). This is clearly not a purely optical device that operates entirely in an optical region, and it indeed uses the conversion of optical signals into electric signals for the purpose of signal processing, which is in sharp contrast to the claimed invention. This alone clearly shows that *Hamilton* completely fails to disclose any teaching or suggestion of a purely optical device that operates entirely in an optical region and that does not require the conversion of optical signals into electric signals for the purpose of signal processing.

On the other hand, *Paiam* only discloses a waveguide demultiplexer, and in particular Fig. 2a of *Paiam* noted by the Examiner only shows a prior-art device in which a

first frequency routing device is optically coupled to a second frequency routing device. Element 12 of Fig. 2a is described as a second frequency routing device which is essentially a multiplexer that multiplexes the wavelengths, not an optical combiner (see col. 4, line 56 to col. 5, line 15). *Paiam* completely fails to suggest or imply the use of this waveguide demultiplexer feature in the electro-optic analog-to-digital converter as disclosed by *Hamilton*, or how *Hamilton*'s device can be turned into a purely optical device that operates entirely in an optical region and that does not require the conversion of optical signals into electric signals for the purpose of signal processing.

Further, *Okugawa* only discloses an optic/electric composite packet switch, which uses the optical gates 6 between the optical routing element 2 and the electric packet switch 11. *Okugawa* completely fails to suggest or imply the use of this electro-optic packet switch feature in the electro-optic analog-to-digital converter as disclosed by *Hamilton*, or how *Hamilton*'s device can be turned into a purely optical device that operates entirely in an optical region and that does not require the conversion of optical signals into electric signals for the purpose of signal processing.

Further, *Tachikawa* only discloses an optical multiplexer/demultiplexer, which uses optical amplifiers on the loop-back optical paths. *Tachikawa* completely fails to suggest or imply the use of this optical multiplexer/demultiplexer feature in the electro-optic analog-to digital converter as disclosed by *Hamilton*, or how *Hamilton*'s device can be turned into a purely optical device that operates entirely in an optical region and that does not require the conversion of optical signals into electric signals for the purpose of signal processing.

Regarding Claim 11, similarly, the Examiner correctly admits that *Hamilton* fails to disclose the claimed optical switch and second optical delay waveguide array. However, the rejection erroneously contends that these missing elements can be supplemented from *Amersfoort*.

Amersfoort only discloses an optical filter or router, which uses optical cross-connect switch. *Amersfoort* completely fails to suggest or imply the use of this optical filter

or router feature in the electro-optic analog-to-digital converter as disclosed by *Hamilton*, or how *Hamilton*'s device can be turned into a purely optical device that operates entirely in an optical region and that does not require the conversion of optical signals into electric signals for the purpose of signal processing.

As discussed above, it is impossible to suggest or imply a purely optical device that operates entirely in an optical region and that does not require the conversion of optical signals into electric signals for the purpose of signal processing, by an arbitrary collection of the disclosures in various mutually unrelated references such as *Hamilton*, *Paiam*, *Okugawa*, *Tachikawa*, *Duguay*, *Ishida*, *Inoue*, *Kito*, and *Amersfoort*. The Examiner's reasoning is clearly based on the hindsight provided by the present application, and there is no motivation in these references for coming up with a particular combination of these references as contemplated by the Examiner.

None of the cited references suggest or imply a specific form of an optical signal processing device as recited in Claim 1, which is capable of carrying out the optical signal processing for reading information on a destination or the like from the optical signals at high speed, by realizing the digital-to-analog conversion of the input optical signals in an optical region, without converting the input optical signals into electric signals for the purpose of signal processing.

Further, none of the cited references suggest or imply a specific form of an optical signal processing device as recited in Claim 11, which is capable of realizing the processing of the optical signals that are multiplexed on a time axis such as interchanges of time-slots, without converting the input optical signals into electric signals for the purpose of signal processing.

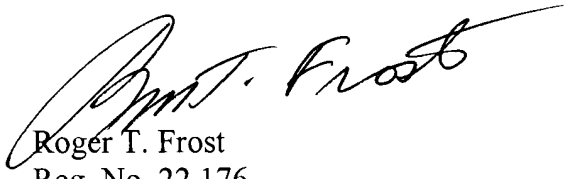
Accordingly, the structural and functional combinations recited in each of Claim 1 and Claim 11 would not have been obvious to one of ordinary skill from the cited references, at the time the Applicant made the claimed invention.

Claims 2-10 and 12-15 depend from independent Claims 1 and 11. The remarks made above in support of the independent claims are equally applicable to distinguish the dependent claims from the cited references.

Consequently, in light of the foregoing amendment and the above discussion, the Examiner's rejections against Claims 1-15 under 35 U.S.C. 103(a) as unpatentable over *Hamilton* in view of various combinations of *Paiam*, *Okugawa*, *Tachikawa*, *Duguay*, *Ishida*, *Inoue*, *Kito*, and *Amersfoort* are respectfully requested to be withdrawn.

The foregoing is submitted as a complete response to the Office Action identified above. This application should now be in condition for allowance, and a notice to that effect is solicited.

Respectfully submitted,



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